

# Nation mourns Edward Teller

Teller is remembered for his devotion to the advancement of science and education

By Lynda Seaver  
NEWSLINE STAFF WRITER

Dr. Edward Teller, world-renowned physicist, co-founder of the Lawrence Livermore National Laboratory and a lifelong advocate for education, died Tuesday, Sept. 9. He was 95.

Teller died at his home, located on the Stanford University campus, in the company of friends and staff. He had suffered a stroke two days previously.

Family funeral arrangements for Teller are pending. Plans are also underway for a public memorial service. When the details of those arrangements become available, information will be published on the Laboratory Website, [www.llnl.gov](http://www.llnl.gov)

Since Teller embarked upon his scientific career, his life intertwined with myriad heads of state, dignitaries and other elected officials. He met with every president since Roosevelt, as well as Pope John Paul II.

Less than two months ago, Teller was awarded the Presidential Medal of Freedom, the nation's highest civil honor, during a special ceremony conducted by President George W. Bush at the White House.

Though Teller could not attend that ceremony — his daughter Wendy accepted the medal on his behalf — he was touched by the honor. "In my long life I had to face some difficult decisions and found myself often in doubt whether I acted in the right way," he said, com-

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## Teller lived and shaped events of the 20th century

NEWSLINE STAFF

Throughout his long life, Edward Teller often found himself at the forefront of the some of the 20th century's most dramatic and history-making endeavors.

Born into a middle-class lawyer's family in Budapest, Hungary in 1908, Teller was educated at

the famous high school that also graduated John von Neumann, Eugene Wigner and Leo Szilard, and then took a degree in chemical engineering at the University of Karlsruhe in Germany. He received his Ph.D. in physics at age 21 from the University of Leipzig, where he learned from his dis-

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# Lab and UC dedicate Edward Teller Education Center

By Don Johnston  
NEWSLINE STAFF WRITER

The Edward Teller Education Center was formally dedicated Tuesday in a fitting tribute to the champion of science education for which it was named.

Teller had been scheduled to attend the morning ceremony but was forced to remain at home after suffering a stroke earlier in the week. He died that afternoon.

"Dr. Teller was still very much a presence at the ceremony," said Stan Hitomi, director of the Edward Teller Education Center, or ETEC. "This center was created in the spirit of Dr. Teller as a man of ideas, a scientist and a teacher.

"Dr. Teller had a self-confessed addiction to teaching, something that he did for over 60 years of his life. Throughout his lifetime Dr. Teller was an



advocate for education, and believed that education was critical for America to maintain its leadership role in the world. It was not a difficult decision when it came to naming our new education center. There was only one choice," said Hitomi.

"Dr. Teller never turned down an offer to meet and engage with students or teachers," he added. "Dr. Teller will always have a connection to education

through ETEC and the Edward Teller Science & Technology Education Symposium that is co-sponsored by ETEC and STEP (Science, Technology and Education Program) at LLNL."

Sponsored by the University of California Office of the President (UCOP) in partnership with the Laboratory, UC Davis and UC Merced, the Edward Teller Education Center (ETEC) is dedicated to improving

science education through professional development for teachers and hands-on programs to stimulate student interest in science.

In attendance were Lab officials, representatives from UCOP, UC Davis, UC Merced, Las Positas College, members of the ETEC Board of Directors, Livermore school district, State Assemblyman Guy Houston's office, the Livermore Chamber of Commerce and local media.

"The idea is to create a bridge from the research laboratory into the classroom," Hitomi said.

ETEC seeks to leverage the Laboratory's "big science" research programs to generate excitement about science and technology by giving teachers a taste of hands-on lab research experience, enthused Hitomi.

"We don't do Tupperware science, we use the real

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# EDWARD TELLER 1908–2003

## The Edward Teller I Knew

Lowell Wood

I’ve been invited to reminisce, very briefly and without notice, about a few of the less obvious aspects of the Edward Teller that I knew.

The Edward Teller seen around the Lab during recent years was almost incredibly old. Now entering my own old age, I met him first when I was but a teen-ager though he was already middle-aged. This man had formed his self-image in the co-capital city of the Austro-Hungarian Empire, and sneered only half-jokingly in recent years about a Viennese mutual friend, “Otto [the Hapsburg pretender, whom Edward first saw as an infant crown prince during a World War I Budapest parade] is my King, but his Emperor.” When I dragged him to a Wagnerian opera performance several years ago (at which he happily sung along from memory with all of the performers, almost too low to be detected by those seated nearby), he recalled with warmth and delight his steady, few-times-per-week attendance of opera matinees in 1920s Budapest as a teenager – and his later operatic attendance in New York City with his protégé Maria Mayer (later a physics Nobel, for the nuclear shell model) as World War II overtook America. While we read as “ancient history” about the Golden Age of physics between 1925–45, this man was there in the thick of it, not only living it but (co-)authoring a stunningly large fraction of it. Moreover, he vividly recalled much of his earlier life; talking with him about the first two-thirds of the 20th century was evocative of the improbable sensation of an exceptionally well-written history book reading itself to you — in the first person.

At the same time, Teller was nearly unbelievably young with respect to much of what really mattered. No one that I have ever known within decades of his age has retained the youthful inquisitiveness, curiosity and mental liveliness that Edward invariably manifested, up through our final hours of technical discussions at the Lab last Thursday afternoon. These commenced with a run-through of the latest cosmological observations and then, when John Nuckolls joined us, moved on to new sources and types of nuclear energy release. Though he was now burdened with failing senses, his questions were nearly as cogent and his intellect as lively and probing as when I first conversed with him in the late ’50s. Particularly striking was his willingness to provisionally lay aside much conventional theoretic



Lowell Wood (left) and Edward Teller worked physics challenges together.

cal physics — his famously strong suit — as he struggled to interpret recent dark matter and energy observations and then exotic experimental nuclear physics results. Such mental elasticity and conceptual boldness isn’t found even in most graduate students. Richard Feynman was the only senior physicist in whom I’ve ever witnessed anything comparable — though with Feynman it sometimes seemed to be willed, while in Teller it always appeared innate.

One final peculiarity of Teller’s must be mentioned: He was unreasonably optimistic. His close friend and fellow Budapesti Eugene Wigner memorably remarked on the unreasonable efficacy of mathematics in making comprehensible the physical world and its functioning. Teller’s unwavering, unflinching, unapologetic optimism on most issues was unreasonable in this sense. He believed that the future could — not

necessarily would, but could — be better than the past, moreover in most every respect. In particular, he believed that technology could improve most aspects of the human condition — perhaps even drastically so, the repeatedly expressed dismay of many of his academic colleagues notwithstanding. Very notably, he was convinced that all people — particularly his friends and most especially his fellow Hungarians — could rise above their human frailties somewhat and perform more like angels in the future than they had in the past. [I have been perhaps the single least deserving beneficiary of this strange prejudice of his.] Most extremely of all, he believed that knowledge is an absolute good, all of history’s caveats notwithstanding. His profession-of-faith in all these respects was simple, eloquent and profoundly radical: “I confess to being an optimist. I do believe that the future is uncertain.”

Edward Teller was a man of very many parts, most all of them highly admirable, only a few of which I’ve quite imperfectly sketched. Marc Antony’s *cri de coeur* over his mentor’s still-bleeding body comes forcibly to mind: “Here was a Caesar! When comes such another?”

## Hungarian roots grow into strong ties

Liz Garcia developed a special bond with Director Emeritus Edward Teller in recent years.

They shared a passion born of their Hungarian roots. “We had a common passion for freedom, for being Hungarian and for chocolate,” said Garcia, born Kinga Erzsébet Nagy.

“But for me it was something deeper that we shared. He was such a strong leader and coming from the same country, he really understood that passion for freedom,” said Garcia, administrative assistant in NAI’s Chemical and Biological Program.

Garcia’s family emigrated to the United States in the wake of the 1956 revolt in Hungary and she felt Teller was one of the few people who could truly relate to her family’s experience. “He related to me as a fellow Hungarian,” she said. “He kept a great sense of pride in his native land.”

Though born in the U.S., Garcia speaks fluent Hungarian and in recent years would assist Teller with his correspondence by reading letters from Hungarian friends and dignitaries. “We always



Edward Teller and Liz Garcia

spoke in Hungarian,” she said. “He was always delighted to hear someone speak in his native language.”

Garcia recalls helping Teller edit a seven-page television script written in Hungarian over several days. “I learned how persistent he was,” she said. “Once he started he wanted to finish it. It was very technical and difficult for me to understand, but I would read it and he painstakingly edited it.

“He was a good teacher and I learned a lot more Hungarian,” Garcia said, recalling that Teller would good naturedly chide her with “you should know that word.”

Teller’s European manners were very much a part of her own upbringing. “He was a real, gentleman.”

Garcia also indulged Teller’s weakness for pastries and sweets, particularly homemade Hungarian “kiflis.”

“I will really miss him. He was like a grandfather to me,” she said. “I have a strong sense of passion about why I’m here in this country. Dr. Teller has a lot to do with that.”

## LabTV to air Edward Teller films

LabTV will air a special collection of films about the life of Edward Teller all day today from 7 a.m. to 9 p.m. on Lab Channel 2. The tapes include: “Magnificent Obsession: The Life of Edward Teller” airing at 7, 9 and 11 a.m., and 1, 3, 5 and 7 p.m.; “Dr. Edward Teller, a Film Biography” airing at 7:30, 9:30 and 11:30 a.m. and 1:30, 3:30, 5:30 and 7:30 p.m.; “A is for Atom, B is for Bomb” airing at 8 and 10 a.m. and at 12, 2, 4, 6 and 8 p.m.

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# EDWARD TELLER 1908–2003



## Young scientist looked to Teller for enlightenment

By David Schwoegler

NEWSLINE STAFF WRITER

Edward Turano didn't only learn how to be a great physicist from the vibrant Edward Teller. He learned some life lessons as well: in citizenship, humanitarianism and the realization that anything is possible.

"I don't think Dr. Teller was cognizant of the word 'impossible'," remarked the young A-Division physicist embarking on his career. For about three years Turano had been one of a cadre of Lab researchers who regularly were asked to join Teller for one-on-one lunches in his office.

"He believed that great ideas could come from anyone. Regardless of our topic of conversation, which could range from the future of nuclear-weapon physics, to the future of medical advancements, or to the future of international politics," Turano said. "Dr. Teller had a way of making the impossible seem feasible.

"He believed that in the defense industry, we are always trying to accomplish the impos-

sible, whether it's regarding technical challenges, financial restrictions or international relations."

Turano thinks Teller deserves much recognition for being an ever-present reminder, not only to the defense community but also to scientists, international relations experts and the public, that no dream for the favorable scientific or social advancement of humankind is impossible or impractical.

"Dr. Teller enlightened me to precious lessons with regard to being a good physicist, citizen, and humanitarian, and he instilled in me a sense of confidence in the pursuit of my convictions, in particular, those convictions relevant to the preservation of liberty, education, and humanitarian issues," he said.

Turano thinks the title "Presidential Medal of Freedom Holder" seems so befitting to Teller. "He was a man dedicated to the cause of international freedoms: freedom from tyranny and oppression, freedom from censorship of scientific investigation, freedom through education, and freedom from government secrecy, to name a few," Turano said.



Edward Turano

## Edward Teller remembered by friends and colleagues

*"Edward combined his intellect with a very crisp sense of humor. He recently asked me, 'Is physics dead?' Quite certainly I said, 'Of course not,' but immediately had to defend my answer with some explanation of cutting-edge work in the field. So I recounted a short discussion I had just read in the New York Times about experiments where scientists had slowed the speed of light. Edward asked me how that worked. After my clearly inadequate interpretation of what I had read, he paused and said, 'I don't understand it either, Bob!'"*

**Bob Kuckuck** NNSA principal deputy administrator/former Laboratory deputy director

*"Dr. Teller lived a spectacular life on the scale of legend. His work was so essential to international science, education and to our individual security and freedom that his role in founding our great national laboratory — a life achievement for any other individual — becomes just one in a long series of monumental accomplishments. He has been so central to the spirit of Lawrence Livermore that I doubt many can truly absorb the impact of his loss. We will finally miss the inspiration he engendered among us and the essence of his genius."*

**Bruce Goodwin**, Defense and Nuclear Technologies associate director

*"Edward Teller always displayed a great affinity for the young. During questions and answers at Lab Family Night about 30 years ago, a 10-year-old asked Teller the difference between applied science and pure science. Edward explained that it was a matter of motivation. 'Imagine a cookie jar on the shelf. If you want a cookie because you're curious to know how a cookie tastes, that's pure science. But if you want the cookie because you're hungry, that's applied science,' Teller told him, enlightening many young minds in the audience as he spoke."*

**Bob Andrews**, retired Laboratory associate director

*"My view of Edward Teller is that it is difficult if not impossible to overstate his influence as a scientist upon the politics and policies of the United States in the 20th century. In many ways, he was a force of nature as much as a human being. His passing marks the end of an era — an era when scientists had extraordinary prestige and influence with the government — for having invented the weapons that won not only the Second World War but the Cold War with the Soviet Union."*

**Gregg Herken**, author and historian

*"Edward Teller had two great interests: physics and human freedom. He saw, early in his long life, the effect that the 20th century's two great political evils would have on human freedom. Thus, he became an implacable and effective foe of both fascism and communism and he lived long enough to see both vanquished. Edward Teller was also one of the world's great*

*physicists. He possessed an unrivaled imagination which permitted him to make fundamental contributions to the theory of beta decay, cosmology, molecular physics and nuclear structure. Finally, Edward was a man of great charm who was totally loyal to his family, his friends and to the United States of America. I have known him and followed his lead for almost 50 years. I will miss him and I mourn his passing. May he rest in peace."*

**Dr. Hans Mark**, professor of aerospace engineering at the University of Texas at Austin; former chancellor of the University of Texas system, 1984–1992; and former U.S. Secretary of the Air Force, 1979–1981

*"Whether you loved Edward Teller or hated him, you had to respect his devotion to his adopted country and his lifelong devotion to science. I view Teller as having had three phases at Los Alamos. The first two are quite well known and somewhat controversial. He came to work on the first atomic bomb during the Manhattan Project. He returned to Los Alamos to work on the hydrogen bomb after the Russians tested their first atomic bomb in 1949. The third phase began in 1986 when I invited Edward to return to Los Alamos. The focus during the third phase was not on weapons or defense, but rather on science more specifically, high-temperature superconductivity. He teamed up with Jim Smith here to try to understand the puzzling discovery of superconductivity at temperatures above liquid nitrogen. His true love for science and the world of discovery showed through like that of a 20-year-old."*

*"Another little-known side of Edward was his charm — especially with women and children. I'll never forget Edward the story teller with my youngest daughter in his lap. He topped off the stories with a piano recital. That made quite an impression on the young piano pupil. Edward Teller spent most of his life devoted to science in service of this nation's freedom. He believed in a strong defense, almost to the point of paranoia. He believed in science and what it can do to make life on Earth better for all. He believed strongly in competition in science to bring out the best in all. It was for that reason that he helped to found the Lawrence Livermore Laboratory. And for that, the nation is better off today."*

**Sig Hecker**, former Los Alamos National Laboratory director

*He did indeed worry — sometimes day and night — that he may not have seen the best way to approach a problem or the best solution to it. But if he made mistakes or failed, he moved forward. It was as if his rule was: keep the past in mind; study the present with all your intellect and focus your actions on the future. Our present is more assured for his seven decades of contributions, and I suspect that future generations will also have reason to recall his life with gratitude."*

**Judith L. Shoolery**, his collaborator and friend at Hoover Institute for 24 years

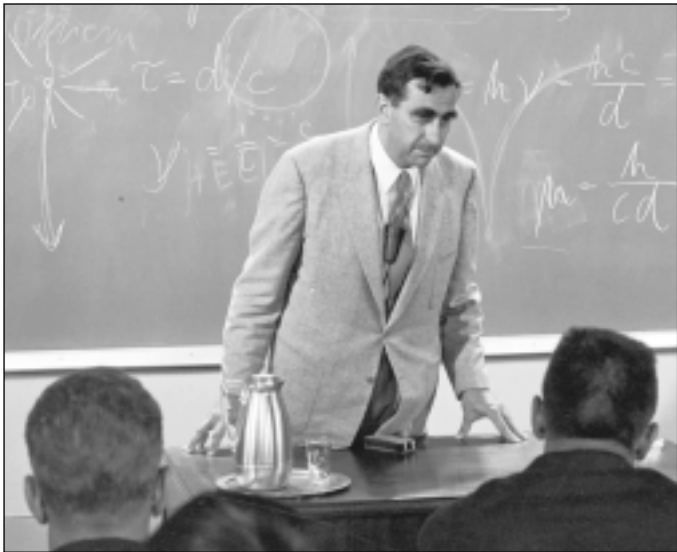




# EDWARD TELLER 1908–2003

## The life and times of Edward Teller

Edward Teller, who developed a love of mathematics as a child, derived great pleasure from teaching. Two other deep loves — his family and music — were at the center of his life. The Teller family enjoyed chess matches, as shown in the photo on this page, as Edward battles son Paul while wife Mici and daughter Wendy advise.



Teller, the young scientist, began his career as a professor of physics.



# EDWARD TELLER 1908-2003



Edward Teller was a dynamic presence in the global community, meeting with world leaders. In a speech about five years ago, he said the Laboratory was one thing with which he was “completely happy.” He helped shape the Lab’s reputation for excellence, having worked as leader, colleague and catalyst.

Below, from left to right, Joanne Smith, Teller’s long-time secretary, Joni Lawson of Lee Younker’s office, Gen Phillips, Teller’s first secretary, and Carol Turner, registered nurse supervisor in Health Services, surround Teller in Bldg. 111.



Concerned that not enough young men and women were choosing science as a career, Teller worked to instill in students the love he had for science. At right, Teller examines one of his many awards with Shirley Petty.







# EDWARD TELLER 1908–2003

## Teller made scientific contributions in diverse fields

There is little doubt that Edward Teller was one of the towering figures of 20th-century physics. Up until his death earlier this week, he was still one of the most influential men of science. Although his early training was in chemical physics and spectroscopy, Teller made substantial contributions to such diverse fields as nuclear physics, plasma physics, astrophysics and statistical mechanics

Although he officially retired from Lawrence Livermore in 1975, Teller divided his time between Livermore, where he was director emeritus, and Stanford University’s Hoover Institution, where he was a senior research fellow.

Teller was expert in many fields. In that respect, Teller is similar to other 20th-century greats like Enrico Fermi, Leo Szilard, and John von Neumann, who all made sizable contributions to more than one field (and who all at one time or another were close colleagues of Teller).

Teller seemed to anticipate society’s needs for scientific and technological solutions, but more than that, he felt an overriding necessity to personally provide answers. Over the years, Teller’s concern for the planet grew to devising ingenious fixes for possible environmental crises. He was the lead author of a paper that outlined technological responses to drastic climate changes.

If the industrial world’s production of carbon dioxide is indeed causing global warming, then safe and



Edward Teller spent much of his life unraveling the mysteries of nuclear physics.

affordable nuclear power, Teller had said, is a sure way to counteract that trend. His interest in safe fission reactors dates to the very beginnings of the atomic age. Shortly after its formation in June 1947, the Atomic Energy Commission established the Reactor Safeguard Committee, with Teller as its first chairman. During the past decade, Teller worked with other Livermore scientists on a new kind of nuclear fission reactor that has

no moving parts and can operate without human intervention for three decades. If widely employed, the reactor could directly reduce present-day worldwide carbon dioxide emissions by twofold, thereby providing “a solution to all aspects of global warming.”

### Teller’s last scientific paper

In January, Dr. Edward Teller called fellow retired Lab employee Ralph Moir to ask if they could meet to work on reactors.

They ended up collaborating for seven months — and the result was Dr. Teller’s last scientific paper, which was submitted to *Nature* magazine on Aug. 5.

The two researchers’ idea is to build an underground nuclear power plant that would be started with uranium or plutonium and sustained with thorium, a metal three times more plentiful than uranium.

“It’s a work of love,” Moir said. “It was intense. We shared the common goal of nuclear power and we worked on it three or four days a week for those months.”

Moir would meet with Teller at the Laboratory twice a week and then drive to Teller’s home on the Stanford campus for three-to-five hour sessions once or twice a week. Their last meeting, on Sept. 4, was for about two hours. They talked about how to get funding for their reactor.

“I’ve been interacting with Edward for 42 years now off and on,” Moir said. “I’m going to miss him.”

## Teller’s honorary degrees and awards

### Honorary Degrees

#### Doctor of Science

- 1954 Yale University
- 1959 University of Alaska
- 1960 Fordham University
- 1960 George Washington University
- 1960 University of Southern California
- 1960 St. Louis University
- 1962 Rochester Institute of Technology
- 1964 University of Detroit
- 1966 Clemson University
- 1969 Clarkson College of Technology
- 1987 Adelphi University

#### Doctor of Law

- 1961 Boston College
- 1961 Seattle University
- 1962 University of Cincinnati
- 1963 University of Pittsburgh
- 1974 Pepperdine University

- 1977 University of Maryland, Heidelberg

#### Doctor of Humane Letters

- 1964 Mount Mary College

#### Doctor of Philosophy

- 1972 Tel Aviv University

#### Doctor of Natural Science

- 1981 De La Salle University, Philippines

#### Doctor of Medical Science, honoris causa

- 1983 Medical University of South Carolina

#### Doctor of Strategic Intelligence

- 1987 Defense Intelligence College

#### Honorary Professorship

- 1991 Eotvos University, Budapest

### Books

**Structure of Matter**, Francis Owen Rice and Edward Teller, John Wiley and Sons, NY, 1949.

**Our Nuclear Future**, Edward Teller and Albert L. Latter, Criterion Books, NY, 1958.

**The Legacy of Hiroshima**, Edward Teller with Allen Brown, Doubleday and Co., Garden City, NY, 1962.

**The Reluctant Revolutionary**, Edward Teller, University of Missouri Press, Columbia, MO, 1964.

**The Constructive Uses of Nuclear Explosives**, Edward Teller, Wilson K. Talley, and Gary H. Higgins, McGraw Hill, NY, 1968.

**Great Men of Physics**, Emilio G. Segrè, Joseph Kaplan, Leonard I. Schiff, and Edward Teller, Tinnon-Brown, Los Angeles, CA, 1969.

**The Miracle of Freedom**, Edward Teller, International Academic and Technical Publications, Boulder, CO, 1972.

**Energy: A Plan for Action**, Edward Teller, available from the Commission on Critical Choices for Americans, NY,

1975.

**Critical Choices for Americans: Power and Security**, Edward Teller, Hans Mark, and John S. Foster, Lexington Books, Lexington, MA, 1976.

**Nuclear Energy in the Developing World**, Edward Teller, Mitre Corporation, Metrek Division, McLean, VA, 1977.

**Energy from Heaven and Earth**, Edward Teller, W. H. Freeman and Co., San Francisco, CA, 1979.

**The Pursuit of Simplicity**, Edward Teller, Pepperdine University Press, Los Angeles, CA, 1980.

**Better a Shield Than a Sword**, Edward Teller, Free Press/MacMillan, New York, NY, 1987.

**Conversations on the Dark Secrets of Physics**, Edward Teller, Wendy Teller, and Wilson Talley, Plenum Press, NY, 1991.

**Memoirs: A Twentieth-Century Journey in Science and Politics**, Edward Teller, Judith Shoolery, Perseus Publishing, Cambridge, MA, 2001

### Honors & Awards

- 1955 Harrison Medal, American Ordnance Association
- 1957 Joseph Priestly Memorial, Dickinson College
- 1958 Albert Einstein Award, Lewis and Rosa Strauss Memorial Fund
- 1959 General Donovan Memorial Award
- 1960 Midwest Research Institute Award • Research Institute of American Living History
- 1961 American Academy of Achievement Golden Plate
- 1962 Thomas E. White Award • Enrico Fermi Award, Atomic Energy Commission
- 1963 Robins Award of America
- 1974 Leslie R. Groves Gold Medal
- 1975 Harvey Prize, Technion Institute of Israel
- 1977 Semmelweis Medal • Albert Einstein Award, Technion Institute of Israel
- 1978 Henry T. Heald Award, Illinois Institute of Technology
- 1980 American College of Nuclear Medicine Gold Medal • Man of Science, Achievement Rewards for College Scientists • Paul Harris Fellow, Rotary • A. C. Eringen Award, Society of Engineering Science, Inc.
- 1981 Distinguished Scientist, National Science Development Board • Distinguished Scientist, Phil-American Academy of Science and Engineering
- 1982 Lloyd Freeman Hunt Citizenship Award, Heritage of Freedom Council • American Academy of Achievement Gold Medal • Jerusalem College of Technology
- 1983 National Medal of Science for 1982
- 1983 Joseph Handleman Prize, Jewish Academy of Arts and Sciences
- 1984 National Security Award, National Coordinating Council on Emergency Management
- 1985 American Preparedness Award, American Civil Defense Association
- 1986 Sylvanus Thayer Award, Association of Graduates, U.S. Military Academy, West Point
- 1987 Strategic Defense Initiative Technical Achievement Award, American Defense Preparedness Association
- 1988 Shelby Cullom Davis Award, Ethics and Public Policy • Fannie and John Hertz Foundation Award
- 1989 Presidential Citizens Medal, President Reagan • DAR Americanism Medal, National Society of the Daughters of the American Revolution
- 1990 Ettore Majorana Erice Scienza Per La Pace, Science Peace Prize, Ettore Majorana Centre for Scientific Culture, Erice, Sicily • Order of Banner with Rubies of the Republic of Hungary, President of the Republic of Hungary, Foreign Minister of the Republic of Hungary
- 1994 Middle Cross with the Star of the Order of Merit of the Republic of Hungary
- 1998 A Magyarsag Hirneveert Dij, highest official Hungarian government award, Prime Minister of the Republic of Hungary
- 1999 Edward Teller Chair endowment, University of California at Davis Department of Applied Science
- 2001 Corvin Medal, Republic of Hungary
- 2002 Department of Energy Gold Award, Energy Secretary Spencer Abraham
- 2003 Presidential Medal of Freedom, President George W. Bush

## EDWARD TELLER 1908–2003



## Tauscher tribute to Teller in U.S. House of Representatives

*Editor's note: The following statement in tribute to Edward Teller was read by Rep. Ellen Tauscher on the floor of the U.S. House of Representatives Thursday.*

"Mr. Chairman, with the passing of Edward Teller on Tuesday, the United States has lost one of our foremost physicists and a lifelong advocate for education. Through his leadership and vision, Lawrence Livermore National Laboratory in my district designed the nuclear weapons that have deterred world wars and the infrastructure that ensures the continuing safety, security, and reliability of our nation's nuclear weapons stockpile without live testing.

"His efforts were instrumental in creating the Livermore site at what was then the

University of California Radiation Laboratory in 1952.

"Teller served as the Laboratory's second director from 1958 to 1960, a time when it was well along in development of the U.S. Navy's Polaris missile warhead. Teller advanced Polaris, the Lab's first military design project. Polaris was validated in a test in 1958, a few months before nuclear testing was halted for a time by a voluntary moratorium.

"The moratorium was one of Teller's greatest challenges. Faced with keeping the Lab viable without testing, plans were laid for a program exploring the peaceful uses of nuclear explosives called Project Plowshare.

"In addition to his contributions to

physics, Teller was a passionate educator and strongly believed that America needed more intensive scientific education to develop future generations of scientists and engineers.

"Less than two months ago, Edward Teller was recognized for his contributions to science with the prestigious Presidential Medal of Freedom, the nation's highest honor.

"As I work with the national laboratories on the cutting-edge programs they have developed in multiple areas, I am constantly reminded of Edward Teller's legacy. I am saddened by this loss but know that he has made lasting and important contributions to the security of the United States. For that, we are all grateful."

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menting on the award. "Thus receiving the medal is a great blessing for me."

Immediately before the ceremony, President Bush called Teller personally to congratulate him. The President told him he was a "great American."

"The loss of Dr. Edward Teller is a great loss for this Laboratory and for the nation," said Michael Anastasio, Laboratory director. "He was a passionate advocate for science, for technology, for education, and for the Lawrence Livermore National Lab. He put his heart and soul into this Laboratory and into ensuring the security of this nation, and his intense dedication never wavered.

"Dr. Teller will long be remembered as one of the most distinguished individuals in science. He devoted his life to preserving freedom, pursuing new knowledge and passing along his passion for science and technology to students of all ages," the director continued.

"On behalf of all employees at Lawrence Livermore National Laboratory, we extend our deepest condolences to Dr. Teller's family. We will greatly miss his enthusiasm and insight, his humor and passion, and the optimism he had for the future."

"Edward Teller was one of the world's leading scientific minds of the 20th century, and he made a major contribution to the security of our nation and world peace," added University of California President Richard C. Atkinson. "It has been a great honor for the University of California to be identified with him and to have had him as a member of our community and a key leader in the national laboratories."

Throughout his long life, Teller often found himself at the forefront of some of the 20th century's most dramatic and history-making endeavors.

Born in Budapest, Hungary in 1908, Teller received his Ph.D. in physics at the University of Leipzig. It was Teller who drove Leo Szilard and Eugene Wigner to meet with Albert Einstein, who signed a letter to President Roosevelt urging him to pursue atomic weapons research before the Nazis did.

"Edward saw in a very personal manner the dismemberment of a weak Hungary in 1918, the military weakness and appeasement of the democracies in the mid 1930s, and the terrible consequences of being unable to oppose militarily a totalitarian government war," said Judith Shoolery who co-wrote "Memoirs: A Twentieth Century Journey in Science and Politics" with Teller. The book was published in 2001.

"The last led to millions of deaths, some of them in his own family, and following that, the imprisonment of millions of people, including his mother, sister, and nephew. These events were something of a first for the world, and he had a view from the

front row. Is it surprising that he saw military strength as important and wanted it for his adopted land?"

Teller went on to work on the Manhattan Project at the fledgling Los Alamos National Laboratory and eventually became assistant director. His efforts were instrumental in creating the Livermore site of the University of California Radiation Laboratory in 1952. It was Teller who strongly advocated development of the hydrogen bomb and promised and delivered a submarine-launched nuclear weapons system. Teller served as director at Livermore for two years and then as associate director for physics.

"I always think of Edward Teller as a passionately patriotic American with a deep Hungarian accent and a dry sense of humor," said Duane Sewell, a Teller colleague and friend for more than 50 years. "He was committed to doing every thing in his power to create a strong America and in my eyes he went a long way toward achieving his goal. In my eyes he was a kind, caring human being."

To Teller, science and education always went hand in hand. He taught physics at the University of California, then created and chaired the Department of Applied Science at UC Davis' Livermore site.

Teller often admitted knowledge was dangerous, but warned that ignorance "can be incomparably more dangerous."

"I have been deeply shaken by the news of the eminent scientist Edward Teller's death," President of the Republic of Hungary Frence Madl said. "Edward was an outstanding man of science in the 20th century — an era that was at once tragic and scientifically intriguing. He stood out as a person in this controversial century. His life, work, faith, as well as his humility and dedication to science made him a key player of his age. His name is now indelible from the pages of universal history and science. His death is an irreplaceable loss to the Hungarian nation and the world."

In 1975 Teller was named Director Emeritus of the Lab and was also appointed Senior Research Fellow at the Hoover Institution. And in the 1980s Teller served as a determined advocate for the development of a ballistic missile defense system to protect the nation from nuclear attack. These efforts contributed to the end of the Cold War.

"Throughout his time at Hoover, Edward was a brilliant, interesting, thought-provoking, collegial, and incredible institutional citizen," said John Raisian, director of the Hoover Institution. "I, for one, will miss his calling me to his office, asking my advice on policy issues, as if I had anything of substance to say to this great man."

Teller received numerous awards for his contributions to physics, his dedication to education and his public life. He published more than a dozen books on subjects ranging from energy policy and defense issues, to his own memoirs.

"A world-renowned scientist has left us who has given a good name to the large community of Hungarians," Prime Minister of the Republic of Hungary Peter Medgyessy said. "One of the great thinkers of the 20th century, Edward Teller died as a man whose fame and recognition radiate on his native Hungary and his compatriots as well. It saddens me deeply to think that the Hungarians of the world cannot any longer count on Edward Teller's support, authority and outspoken wisdom."

Though Teller "retired" more than 20 years ago, his dedication to the Lab never wavered, and he came into his office two to three times each week. Teller was in his office last week, days before his stroke.

"Dr. Teller continually challenged the Laboratory to push further, faster and in novel directions," said Bruce Tarter, former Lab director and now associate director at large. "He had an unshakable faith in the value of scientific progress and the power of technology to improve the world. He strongly believed that the Laboratory he helped found was the right place to carry out this vision and his personal inspiration for these tasks will be missed by everyone at the Laboratory."

"I believe America and the free world owe Edward Teller a great debt of gratitude for his historic contribution to the defense of freedom, extending from the beginning of the Second World War and throughout the Cold War," added John Nuckolls, former Lab director.

Teller's second great legacy is the Livermore Laboratory, which he co-founded in 1952 and personally inspired throughout half-a-century, Nuckolls added. "Through this Laboratory, Edward Teller's commitment to science and the cause of freedom lives on in the 21st century," Nuckolls said.

Teller is survived by his son Paul, daughter Wendy, four grandchildren and one great grandchild. His wife of 66 years, Mici, died three years ago.

"We are deeply saddened by the news of the death of Dr. Edward Teller and send our condolences to his family," said Energy Secretary Spence Abraham. "As I said last year when I presented him the Secretary's Gold Award in recognition of his outstanding contributions to science and the security of the nation, Dr. Teller is one of the giant figures of the 20th century, whose contributions to winning both World War II and the Cold War are immeasurable. Dr. Teller had an impact not only on science, but on generations of scientists who worked with him and learned from him. All of us are going to miss his inspired and creative genius."

***Teller's family has asked that in lieu of flowers, tax-deductible donations can be made to the Fannie and John Hertz Foundation. Further information on the Hertz Foundation is available by contacting Mrs. Barbara Nichols, senior administrator, at (925) 373-1642, or [barb@hertzfoundation.org](mailto:barb@hertzfoundation.org) or Dr. John F. Holzrichter, president, at [jfh@hertzfoundation.org](mailto:jfh@hertzfoundation.org)***



ETEC

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tools of science,” Hitomi said. “Everything we do is based on real scientific research going on at the Lab.”

Borrowing from media coverage of the Iraq war, he explained, “teachers are ‘embedded’ in research programs.”

Hitomi said the center is being built on two ideas Director Emeritus Edward Teller thought primordial to teaching science: science teachers must be able to share the excitement of why they got into science, and teachers need to share the latest breakthroughs and what is cutting edge in science.

“Here at ETEC we’re doing that,” he said. “We partner research scientists with classroom teachers. Together they create this bridge from the research laboratory to the classroom.”

A key to the success of ETEC is creating partnerships and collaborations, Hitomi said. “We can’t do this alone. We’re leveraging a large number of people, a large number of institutes across a large number of disciplines.”

Hitomi credited Rick Freeman, former director of the UC Davis Department of Applied Science; Don Correll, director of the Lab’s Science and Technology Education Program; and Dick Farnsworth, outreach manager for K-12 education, with coming up with the initial vision for ETEC three years ago.

Hal Graboske, acting deputy director for Science



JACQUELINE MCBRIDE/NEWSLINE

From left: Jeff Wright, UC Merced; Harold Levine, UC Davis; Karen Merritt, UCOP; Laura Gilliom, LLNL’s URP; Stan Hitomi, ETEC; and Hal Graboske, LLNL deputy director for Science and Technology.

and Technology, emphasized that the Lab has a vested interest in ETEC’s success. “This is important what we’re doing here,” Graboske said. “The Laboratory’s mission is national security and to do that we have to have the best science and technology.”

To remain at the forefront of science and technology, the Lab needs to bring in young scientists able to take on scientific challenges, Graboske said. “That’s what this enterprise is going to do.

“The Laboratory is here to help in this enterprise,”

he added. “We’re a part of UC and that’s important.”

He also noted that ETEC is a reflection of its founding inspiration, Edward Teller. “Teller went into schools to talk to students about science. He loved interacting with young people,” Graboske said.

Harold Levine, Dean of the UC Davis School of Education, said, “the promise of ETEC is the development of curriculum and a powerful model of teacher development.”

Also speaking at the ceremony were Karen Merritt of UCOP and Jeff Wright, dean of the UC Merced Engineering Department. Though unable to attend the ceremony, UC President Richard Atkinson said in a statement:

“The Edward Teller Education Center is an example of the important educational collaborations between the University of California, Department of Energy and the national Laboratories. The center will be a tremendous asset to the community and the educational mission of California.”

At the conclusion of speeches, Hitomi showed a videotape of comments Teller made during a May 1990 panel discussion underscoring the importance of science education.

“If we’re not going to make a determined effort for more education in the hard sciences and engineering,” Teller warned, “then we better stop thinking of the United States as a leading country in the world.”

TELLER BIO

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sertation supervisor Werner Heisenberg, of Uncertainty Principle fame, to exercise the new tools of quantum mechanics in fundamental molecular-physics studies. He then participated in developing the new quantum physics in Copenhagen as a postdoctoral fellow, in the celebrated school of Niels Bohr.

During 1931–32, he worked in association with James Franck at the University of Göttingen in Germany. With the rise of German fascism, he left Germany and in 1933–34, he again worked in Copenhagen with Niels Bohr.

In February 1934, he married “Mici” (Augusta Maria) Harkanyi, the sister of a longtime friend, while a Rockefeller Foundation fellow.

After teaching at London City College in 1934, he was appointed Professor of Physics at George Washington University in Washington, DC in 1935, where he continued to work until 1941. During the ’30s, he authored more than 60 scientific papers in the fields of quantum physics, molecular physics and nuclear physics, many of them still textbook-examples of theoretical science, creating a record for seminal productivity that has seldom been equaled and establishing him as one of the preeminent physicists of the 20th century.

Prior to the announcement to the scientific community of the discovery of fission in 1939, Teller’s research was entirely theoretical and had a wholly basic-science character. President Franklin Roosevelt’s call-to-arms to the American scientific community as war broke out in Europe profoundly affected Teller, and he become involved in the applied nuclear physics studies then centered at Columbia University. It was Teller who drove Leo Szilard and Eugene Wigner to Albert Einstein’s summer home on Long Island in 1939, where Einstein signed a letter to President Roosevelt urging him to pursue atomic weapons research before the Nazis could preempt the field.

In recollections, Teller quipped that he suspected that the only reason he became a part of the trio urging Einstein to advise Roosevelt urgently to take action was “because I was the only one who knew how to drive and had a car to get us there.” A half-year later, Teller personally pleaded successfully with the government for an initial grant of \$6,000 in support of Fermi’s nuclear reactor-directed studies at Columbia, an action that served to launch what grew into the Manhattan Project.

In 1943, after three years of ever-increasing involvement with the work of the Manhattan Project, Teller went to work at the just-opened Los Alamos National Laboratory. There he contributed seminally

to the realization of implosion-type nuclear fission devices, as well as leading the Lab’s small-scale efforts in thermonuclear research.

Following the war’s end in 1945, Teller returned to fundamental research at the University of Chicago, coming back to work at the Los Alamos Lab only during academic summer vacations. During these later ’40s summer sojourns, he and his colleagues developed several different design approaches to thermonuclear devices, but none of these were deemed to be obviously workable.

During 1949–50, galvanized by the first Soviet nuclear bomb test, Teller contributed decisively to President Truman’s decision to make thermonuclear devices a major part of the U.S. defense program, and he led the design efforts that culminated in the first thermonuclear device tests in 1951–52, serving as assistant director of the Lab in the course of this work.

His advocacy of competition in the national interest to ensure excellence in nuclear developments led to creation of the Livermore site of what was then called the University of California Radiation Laboratory in 1952. It was Teller who strongly advocated development of thermonuclear weaponry, epitomized by his famous, then-seemingly absurd promise to realize a warhead that could be launched on a long-range missile carried by a submarine.

In later years, Teller loved to relate how his outraged Livermore subordinates initially insisted that he retract the promise, but then went on to swiftly develop a warhead of far more outstanding specifications than he has promised. Teller served as Laboratory director for two years in the late ’50s and thereafter as associate director for physics until his retirement in 1975.

In 1975, he was named director emeritus of the Lab by the University of California, and also was appointed a senior research fellow of the Hoover Institution at Stanford University, positions that he held until his death. He last worked at the Lab three days before suffering the stroke that would lead to his death.

In the 1980s, Teller was a staunch advocate of the development of means to protect the nation from nuclear attack, a part of his advocacy of strategic defenses dating from the late ’50s. These efforts — epitomized by the X-ray laser and Brilliant Pebbles programs of the Strategic Defense Initiative of the Reagan and first Bush administrations — are widely credited with contributing to the favorable conclusion of the Cold War.

During most of the ’80s, he served on the White House Science Council. In the ’90s, he vigorously advocated reconciliation and cooperation between the science and technology communities of the east and west, memorably leading American delegations to

international conferences at former Soviet nuclear research centers.

Teller, a passionate, committed and highly effective educator, taught both introductory and advanced physics during the ’60s at most of the UC campuses, as one of the first university professors. In the midst of these efforts, he founded and served as the first chairman of the Department of Applied Science at the Livermore site of the UC Davis campus.

Teller received many awards, both national and international, for his contributions to physics, his dedication to education and his life as a public citizen. He authored more than a dozen books on subjects ranging from energy policy and defense issues to peaceful applications of nuclear energy and popularization of science, literary efforts that culminated recently with publication of his own memoirs.

Teller is survived by his son Paul, daughter Wendy and several grandchildren. His wife of 66 years died three years ago.

Despite his distinguished life, Teller always remained humble in his accomplishments. “What I did, I did because it was necessary, not to be remembered. The little contributions I made in pure science...I am proud of those. And whomever wants to remember that, fine.”



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